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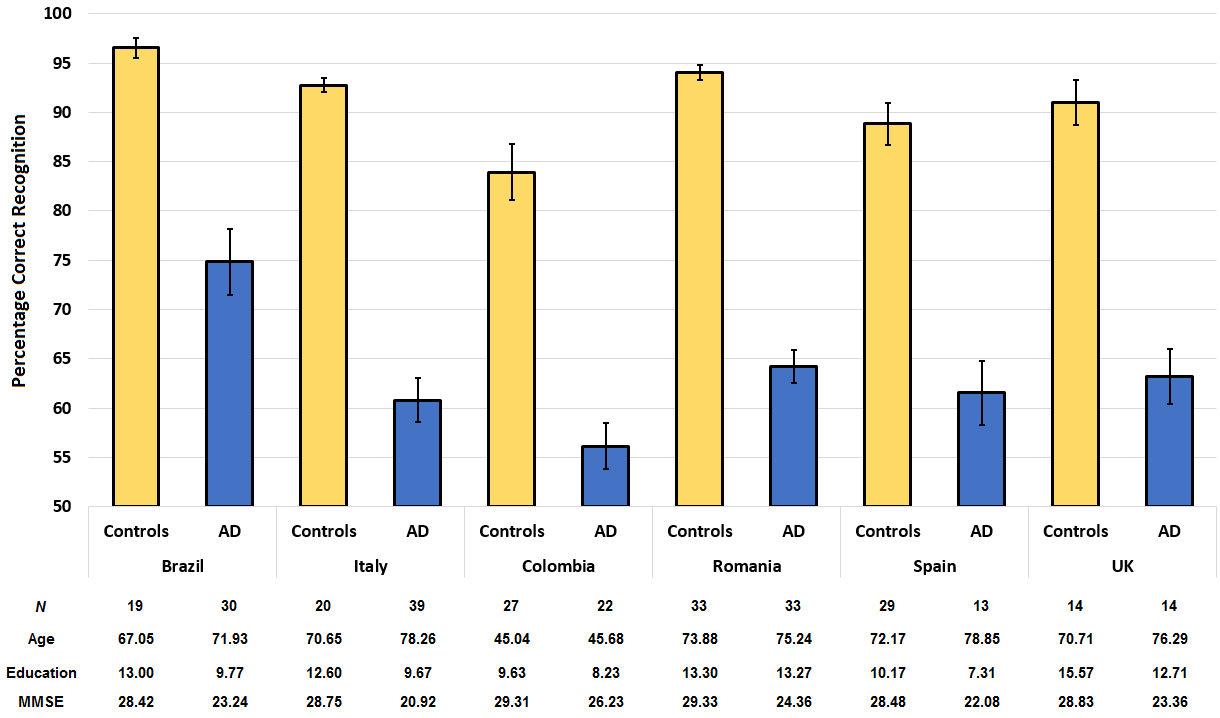
**Background:** Global initiatives for Alzheimer's disease (AD) need cognitive screening tools that hold global reliability. Such tools would allow screening for dementia in ageing populations across countries with different socio-demographic structures. Psychometric tests have for long faced the negative impact of confounding factors such as education, age and ethnicity, which have proved difficult to fully control for. A recently developed temporary memory binding test appears to overcome these limitations. Here we present global data collected with the Short-Term Memory Binding Test (STMBT) to support the hypothesis that the cognitive construct underlying temporary binding remains stable across populations with different socio-demographic backgrounds.

**Methods:** We present data from 293 subjects (142 healthy controls and 151 patients with AD dementia) who have performed the STMBT following procedures harmonized across countries. We show data from 6 countries (Brazil, Italy, Colombia, Romania, Spain, and the UK) which have very different socio-cultural backgrounds. The STMBT requires participants to detect whether or not two combinations of shape and colour change across two sequential arrays. The percentage of correct recognition is measured along with other neuropsychological variables.

**Results**: Significant temporary binding deficits are found in all the AD samples (Figure 1). Such samples significantly differed in age ($F(5,287)=126.22$, $p < 0.001$) and education ($F(5,287)=11.89$, $p < 0.001$). However, neither factor accounted for the effect of Group ($F(1,228)=238.16$, $p < 0.001$) or modified the Group x Country interaction, which failed to meet the significance threshold ($F(4,228)=2.38$, $p=0.06$). Education was excluded from a step-wise regression model which retained the STMB score as the main Group predictor (i.e., total adjusted $R^2$: 59.4% -$F(3,288)=142.86$, $p<0.001$-; STMB: 54.7% -$F(1,290)=352.2$, $p<0.001$-, Country contributed only 2% and Age 3% of the explained variance).

**Conclusions:** A simple, quick, and easy to administer test which can be applied using computers or flash cards is providing solutions that can meet the needs of global dementia strategies. STMB reveals the presence of AD in pre-symptomatic or in early symptomatic stages. It has helped differentiate AD form other non-AD dementias. Thus, STMB is a transcultural cognitive marker of AD.




| | Brazil | | Italy | | Colombia | | Romania | | Spain | | UK | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Controls | AD | Controls | AD | Controls | AD | Controls | AD | Controls | AD | Controls | AD |
| *N* | 19 | 30 | 20 | 39 | 27 | 22 | 33 | 33 | 29 | 13 | 14 | 14 |
| Age | 67.05 | 71.93 | 70.65 | 78.26 | 45.04 | 45.68 | 73.88 | 75.24 | 72.17 | 78.85 | 70.71 | 76.29 |
| Education | 13.00 | 9.77 | 12.60 | 9.67 | 9.63 | 8.23 | 13.30 | 13.27 | 10.17 | 7.31 | 15.57 | 12.71 |
| MMSE | 28.42 | 23.24 | 28.75 | 20.92 | 29.31 | 26.23 | 29.33 | 24.36 | 28.48 | 22.08 | 28.83 | 23.36 |

**Figure 1.** Mean percentage of correct recognition (error bars = SEM) from samples of AD patients and healthy controls collected in 6 different Countries. Such samples significantly differed in age and education, but these factors did not explain the temporary binding deficits observed in this type of dementia.